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1: FEBS Lett 1993 Jul 26;327(2):231-6

ELSEVIER SCIENCE
FULL-TEXT ARTICLE

Protegrins: leukocyte antimicrobial peptides that combine features of corticostatic defensins and tachyplesins.

Kokryakov VN, Harwig SS, Panyutich EA, Shevchenko AA, Aleshina GM, Shamova OV, Korneva HA, Lehrer RI.

Department of Medicine, UCLA 90024.

Porcine leukocytes contained three homologous peptides, PG-1, 2 and 3, that manifested potent microbicidal activity against *Escherichia coli*, *Listeria monocytogenes* and *Candida albicans* in vitro. The peptides ('protegrins') were composed of 16 (PG-2) or 18 amino acid residues, and, like tachyplesins (broad-spectrum antibiotic peptides of horseshoe crab hemocytes), they contained two intramolecular cystine disulfide bonds. Considerably smaller than defensins, protegrins nevertheless showed substantial homology to them, especially to the 'corticostatic' rabbit defensin, NP-3a. The relatively simple structure of protegrins should provide useful prototypes for constructing congeners with selectively enhanced host defense activities.

PMID: 8335113 [PubMed - indexed for MEDLINE]

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☐ 1: 1KWI.A. Chain A, Crystal ...[gi:24987482]

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LOCUS 1KWI_A 101 aa linear MAM 29-JAN-2002
 DEFINITION Chain A, Crystal Structure Analysis Of The Cathelicidin Motif Of
 Protegrins.
 ACCESSION 1KWI_A
 VERSION 1KWI_A GI:24987482
 DBSOURCE pdb: molecule 1KWI, chain 65, release Jan 29, 2002;
 deposition: Jan 29, 2002;
 class: Antimicrobial Protein;
 source: Mol_id: 1; Organism_scientific: Sus Scrofa;
 Organism_common: Pig; Gene: Pg3; Expression_system: Escherichia
 Coli; Expression_system_common: Bacteria; Expression_system_strain:
 B121(De3); Expression_system_vector_type: Plasmid;
 Expression_system_plasmid: Pet15b;
 Exp. method: X-Ray Diffraction.

KEYWORDS
 SOURCE Sus scrofa (pig)
 ORGANISM Sus scrofa
 Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 Mammalia; Eutheria; Cetartiodactyla; Suina; Suidae; Sus.

REFERENCE 1 (residues 1 to 101)
 AUTHORS Sanchez,J.F., Hoh,F., Strub,M.P., Aumelas,A. and Dumas,C.
 TITLE Structure of the cathelicidin motif of protegrin-3 precursor:
 structural insights into the activation mechanism of an
 antimicrobial protein
 JOURNAL Structure (Camb) 10 (10), 1363-1370 (2002)
 MEDLINE 22266136
 PUBMED 12377122

REFERENCE 2 (residues 1 to 101)
 AUTHORS Sanchez,J.F., Hoh,F., Strub,M.P., Aumelas,A. and Dumas,C.
 TITLE Direct Submission
 JOURNAL Submitted (29-JAN-2002)

COMMENT Revision History:
 OCT 9 2 Initial Entry.

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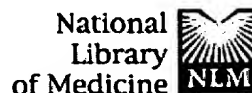
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Purification, primary structure, and antimicrobial activities of a guinea pig neutrophil defensin.

Selsted ME, Harwig SS.

A broad-spectrum antimicrobial peptide present in guinea pig neutrophils was isolated, characterized biochemically, and assessed for microbicidal range and potency in vitro. The guinea pig neutrophil peptide (GPNP) was purified to homogeneity from a granule-rich subcellular fraction of peritoneal exudate neutrophils by gel filtration and reversed-phase high-performance liquid chromatography. GPNP was microbicidal for selected bacterial, fungal, and viral test organisms at concentrations in the microgram per milliliter range. Composition and primary structure analyses revealed that GPNP was homologous to a recently characterized family of antimicrobial peptides, termed defensins, isolated from rabbit and human neutrophils. The entire amino acid sequence of GPNP was determined, revealing that 8 of 31 residues were among those invariant in six rabbit and three human defensin peptides. The conserved sequence included six disulfide-linked cysteine residues, a common structural feature of defensins. The sequence of GPNP also included three nonconservative substitutions in positions otherwise invariant in the human and rabbit peptides. Characterization of GPNP provides new insight into structural features which may be essential for the broad-spectrum antimicrobial activities of defensins.

PMID: 3623703 [PubMed - indexed for MEDLINE]

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1: Curr Opin Immunol 1994 Aug;6(4):584-9

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Defensins.

Ganz T, Lehrer RI.

Department of Medicine, UCLA School of Medicine 90024.

Defensins are widely distributed and abundant 3-4 kDa antimicrobial peptides that are variable cationic and contain six disulfide-paired cysteines. Three structurally distinct peptide families have been identified: 'classical' defensins, beta-defensins and insect defensins. In many animal species, defensin genes are found in clusters with substantial sequence variability outside the core disulfide-linked cysteines. Defensin peptides have been found in the granules of phagocytes and intestinal Paneth cells, on epithelial surfaces of the intestine and the trachea, and in the hemolymph of insects. They are produced from larger precursors by stepwise, tissue-specific, proteolytic processing, a production resembling that of peptide hormones. Microbes in the phagocytic vacuoles of granulocytes and certain macrophages encounter high concentrations of defensins. Increased transcription of defensin genes and stimulus-dependent release of pre-synthesized defensin-containing cytoplasmic granules contribute to the local antimicrobial response.

Publication Types:

- Review
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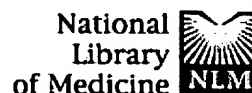
PMID: 7946046 [PubMed - indexed for MEDLINE]

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1: Biochemistry 1995 Oct 17;34(41):13663-71

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Solution structure of bovine neutrophil beta-defensin-12: the peptide fold of the beta-defensins is identical to that of the classical defensins.

Zimmermann GR, Legault P, Selsted ME, Pardi A.

Department of Chemistry and Biochemistry, University of Colorado at Boulder
80309-0215, USA.

The solution structure is reported for bovine neutrophil beta-defensin-12 (BNBD-12), a member of the beta-defensin family of antimicrobial peptides. Structural constraints in the form of proton-proton distances, dihedral angles, and hydrogen bond constraints were derived from two-dimensional, homonuclear magnetic resonance spectroscopy experiments. The three-dimensional structure of BNBD-12 was calculated using distance geometry and restrained molecular dynamics. An ensemble of structures with low NOE constraint violation energies revealed a precisely defined triple-stranded, antiparallel beta-sheet as the structural core of the peptide. The N-terminal beta-strand and three locally well-defined tight turns form a hydrophobic face. Conserved isoleucine and glycine residues form a beta-bulge structure which initiates a beta-hairpin secondary structure motif composed of the second and C-terminal beta-strands. The beta-hairpin contains numerous charged residues and forms the cationic face of BNBD-12. The N-terminal residues were found to be disordered, due to an absence of tertiary NOEs. The triple-stranded beta-sheet, the beta-bulge preceding the hairpin, and the cationic/hydrophobic amphiphilic character are definitive features of all defensin structures determined to date. Further, we predict that the tracheal antimicrobial peptide (TAP) and the recently described gallinacins will have tertiary structures similar to that of BNBD-12.

PMID: 7577957 [PubMed - indexed for MEDLINE]

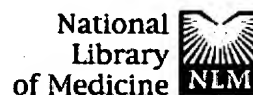
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1: FEBS Lett 1994 Apr 11;342(3):281-5

[Related Articles, Links](#)**Gallinacins, cysteine-rich antimicrobial peptides of chicken leukocytes.****Harwig SS, Swiderek KM, Kokryakov VN, Tan L, Lee TD, Panyutich EA, Aleshina GM, Shamova OV, Lehrer RI.**

Department of Medicine, UCLA Center for the Health Sciences 90024.

We purified three homologous antimicrobial peptides ('gallinacins') from chicken leukocytes, examined their antimicrobial activity in vitro, and established their primary sequences by a combination of gas phase microsequencing and on-line LC-ESI-MS analysis of endo- and exoprotease peptide digests. The peptides contained 36-39 amino acid residues, were relatively cationic due to their numerous lysine and arginine residues, and each contained 3 intramolecular cystine disulfide bonds. Gallinacins showed primary sequence homology to the recently delineated beta-defensin family, heretofore found only in the respiratory epithelial cells and neutrophils of cattle, suggesting that beta-defensins originated at least 250 million years ago, before avian and mammalian lineages diverged. The 9 invariant residues (6 cysteines, 2 glycines and 1 proline) common to avian gallinacins and bovine beta-defensins are likely to constitute the essential primary structural motif of this ancient family of host-defense peptides.

PMID: 8150085 [PubMed - indexed for MEDLINE]

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☐ 1: Eur J Biochem 1998 Sep 1;256(2):404-10

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Solution structure of thanatin, a potent bactericidal and fungicidal insect peptide, determined from proton two-dimensional nuclear magnetic resonance data.

Mandard N, Sodano P, Labbe H, Bonmatin JM, Bulet P, Hetru C, Ptak M, Vovelle F.

Centre de Biophysique Moleculaire, CNRS-UPR 4301, University of Orleans, France.

Thanatin is the first inducible insect peptide that has been found to have, at physiological concentrations, a broad range of activity against bacteria and fungi. Thanatin contains 21 amino acids including two cysteine residues that form a disulfide bridge. Two-dimensional (2D) ¹H-NMR spectroscopy and molecular modelling have been used to determine its three-dimensional (3D) structure in water. Thanatin adopts a well-defined anti-parallel beta-sheet structure from residue 8 to the C-terminus, including the disulfide bridge. In spite of the presence of two proline residues, there is a large degree of structural variability in the N-terminal segment. The structure of thanatin is quite different from the known structures of other insect defence peptides, such as antibacterial defensin and antifungal drosomycin. It has more similarities with the structures of various peptides from different origins, such as brevinins, protegrins and tachyplesins, which have a two-stranded beta-sheet stabilized by one or two disulfide bridges. Combined with activity test experiments on several truncated isoforms of thanatin, carried out by Fehlbaum et al. [Fehlbaum, P., Bulet, P., Chernysh, S., Briand, J. P., Roussel, J. P., Letellier, L., Hetru, C. & Hoffmann, J. (1996) Proc. Natl Acad. Sci. USA 93, 1221-1225], our structural study evidences the importance of the beta-sheet structure and also suggests that anti-Gram-negative activity involves a site formed by the Arg20 side-chain embedded in a hydrophobic cluster.

PMID: 9760181 [PubMed - indexed for MEDLINE]

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☐ 1: Hoffmann JA, Hetru C.


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 **Insect defensins: inducible antibacterial peptides.**
Immunol Today. 1992 Oct;13(10):411-5. Review.
PMID: 1418378 [PubMed - indexed for MEDLINE]


☐ 2: Bulet P, Coziancich S, Dimarcq JL, Lambert J, Reichhart JM, Hoffmann D, Hetru C, Hoffmann JA. Related Articles, Links

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J Biol Chem. 1991 Dec 25;266(36):24520-5.
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☐ 3: Bulet P, Coziancich S, Reuland M, Sauber F, Bischoff R, Hegy G, Van Dorsselaer A, Hetru C, Hoffmann JA. Related Articles, Links

 **A novel insect defensin mediates the inducible antibacterial activity in larvae of the dragonfly Aeschna cyanea (Paleoptera, Odonata).**
Eur J Biochem. 1992 Nov 1;209(3):977-84.
PMID: 1425705 [PubMed - indexed for MEDLINE]


☐ 4: Coziancich S, Dupont A, Hegy G, Lanot R, Holder F, Hetru C, Hoffmann JA, Bulet P. Related Articles, Links

 **Novel inducible antibacterial peptides from a hemipteran insect, the sap-sucking bug Pyrrhocoris apterus.**
Biochem J. 1994 Jun 1;300 (Pt 2):567-75.
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 **Insect immunity: isolation of three novel inducible antibacterial defensins from the vector mosquito, Aedes aegypti.**
Insect Biochem Mol Biol. 1995 Jul;25(7):867-73.
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Insect Biochem Mol Biol. 1994 Apr;24(4):403-10.
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 **Defensins: endogenous antibiotic peptides from human leukocytes.**
Ciba Found Symp. 1992;171:276-90; discussion 290-3. Review.
PMID: 1302183 [PubMed - indexed for MEDLINE]

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- 10: [Dimarcq JL](#), [Hoffmann D](#), [Meister M](#), [Bulet P](#), [Lanot R](#), [Reichhart JM](#), [Hoffmann JA](#). [Related Articles](#), [Links](#)
Characterization and transcriptional profiles of a *Drosophila* gene encoding an insect defensin. A study in insect immunity.
Eur J Biochem. 1994 Apr 1;221(1):201-9.
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Insect immunity. Isolation from the lepidopteran *Heliothis virescens* of a novel insect defensin with potent antifungal activity.
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PMID: 10092609 [PubMed - indexed for MEDLINE]
- 12: [Kokriakov VN](#), [Stefanov VE](#), [Aleshina GM](#), [Shamova OV](#), [Korneva EA](#), [Harwig SS](#), [Lehrer RI](#). [Related Articles](#), [Links](#)
[Defensins and antibiotic peptides related to them in the evolution of animal protective systems]
Zh Evol Biokhim Fiziol. 1997 Jan-Feb;33(1):109-23. Review. Russian. No abstract available.
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Novel antibacterial peptides isolated from a European bumblebee, *Bombus pascuorum* (Hymenoptera, Apoidea).
Insect Biochem Mol Biol. 1997 May;27(5):413-22.
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- 14: [Dimarcq JL](#), [Zachary D](#), [Hoffmann JA](#), [Hoffmann D](#), [Reichhart JM](#). [Related Articles](#), [Links](#)
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EMBO J. 1990 Aug;9(8):2507-15.
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Bioessays. 1991 Dec;13(12):657-63. Review.
PMID: 1789783 [PubMed - indexed for MEDLINE]
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Defensins: antimicrobial and cytotoxic peptides of mammalian cells.
Annu Rev Immunol. 1993;11:105-28. Review.
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Inducible immune factors of the vector mosquito *Anopheles gambiae*: biochemical purification of a defensin antibacterial peptide and molecular cloning of preprodefensin cDNA.
Insect Mol Biol. 1996 Aug;5(3):203-10.
PMID: 8799739 [PubMed - indexed for MEDLINE]
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Purification and characterization of a scorpion defensin, a 4kDa antibacterial peptide presenting structural similarities with insect defensins and scorpion toxins.
Biochem Biophys Res Commun. 1993 Jul 15;194(1):17-22.
PMID: 8333834 [PubMed - indexed for MEDLINE]
- 19: [Chalk R](#), [Albuquerque CM](#), [Ham PJ](#), [Townson H](#). [Related Articles](#), [Links](#)
Full sequence and characterization of two insect defensins: immune peptides from the mosquito *Aedes aegypti*.

Proc R Soc Lond B Biol Sci. 1995 Aug 22;261(1361):217-21.
PMID: 7568275 [PubMed - indexed for MEDLINE]

☐ 20: Hoffmann JA.

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Innate immunity of insects.

Curr Opin Immunol. 1995 Feb;7(1):4-10. Review.

PMID: 7772280 [PubMed - indexed for MEDLINE]

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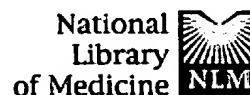
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A novel insect defensin mediates the inducible antibacterial activity in larvae of the dragonfly *Aeschna cyanea* (Paleoptera, Odonata).

Bulet P, Cociancich S, Reuland M, Sauber F, Bischoff R, Hegy G, Van Dorselaer A, Hetru C, Hoffmann JA.

Laboratoire de Biologie Generale, Universite Louis Pasteur, Unite de Recherche Associee, Centre National de la Recherche Scientifique 1490, Strasbourg, France.

The injection of low doses of bacteria into the aquatic larvae of dragonflies (*Aeschna cyanea*, Odonata, Paleoptera) induces the appearance in their hemolymph of a potent antibacterial activity. We have isolated a 38-residue peptide from this hemolymph which is strongly active against Gram-positive bacteria and also shows activity against one of the Gram-negative bacteria which was tested. The peptide is a novel member of the insect defensin family of inducible antibacterial peptides, which had so far only been reported from the higher insect orders believed to have evolved 100 million years after the Paleoptera. *Aeschna* defensin is more potent than defensin from the dipteran *Phormia*, from which its structure differs in several interesting aspects, which are discussed in the paper.

PMID: 1425705 [PubMed - indexed for MEDLINE]

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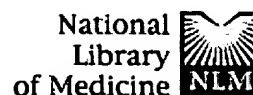
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Insect defensins: inducible antibacterial peptides.

Hoffmann JA, Hetru C.

Laboratoire de Biologie Generale Universite Louis Pasteur, CNRS Research Unit 1490, Strasbourg, France.

In response to bacterial challenge or trauma, insects produce a battery of bactericidal or bacteriostatic molecules with a broad spectrum of activity against Gram-positive and/or Gram-negative bacteria; most are small-sized cationic peptides. This review focuses on insect defensins, a large group of inducible antibacterial peptides that are present both in ancient and recent insect orders. This immune response of insects shares many of the characteristics of the mammalian acute phase response.

Publication Types:

- Review
- Review, Tutorial

PMID: 1418378 [PubMed - indexed for MEDLINE]

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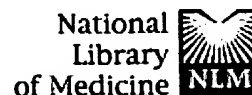
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Anim Genet. 1998 Aug;29(4):283-9.

PMID: 9745666 [PubMed - indexed for MEDLINE]

☐ **2:** Zimmermann GR, Legault P, Selsted ME, Pardi A.[Related Articles, Links](#)**Solution structure of bovine neutrophil beta-defensin-12: the peptide fold of the beta-defensins is identical to that of the classical defensins.**

Biochemistry. 1995 Oct 17;34(41):13663-71.

PMID: 7577957 [PubMed - indexed for MEDLINE]

☐ **3:** Harwig SS, Swiderek KM, Kokryakov VN, Tan L, Lee TD, Panyutich EA, Aleshina GM, Shamova OV, Lehrer RI. [Related Articles, Links](#)**Gallinacins: cysteine-rich antimicrobial peptides of chicken leukocytes.**

FEBS Lett. 1994 Apr 11;342(3):281-5.

PMID: 8150085 [PubMed - indexed for MEDLINE]

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- ☐ 1: Harwig SS, Swiderek KM, Kokryakov VN, Tan L, Lee TD, Panyutich EA, Aleshina GM, Shamova OV, Lehrer RI. Related Articles, Links

 **Gallinacins: cysteine-rich antimicrobial peptides of chicken leukocytes.**
FEBS Lett. 1994 Apr 11;342(3):281-5.
PMID: 8150085 [PubMed - indexed for MEDLINE]


- ☐ 2: Kokryakov VN, Harwig SS, Panyutich EA, Shevchenko AA, Aleshina GM, Shamova OV, Korneva HA, Lehrer RI. Related Articles, Links

 **Protegrins: leukocyte antimicrobial peptides that combine features of corticostatic defensins and tachyplesins.**
FEBS Lett. 1993 Jul 26;327(2):231-6.
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- ☐ 3: Selsted ME, Tang YQ, Morris WL, McGuire PA, Novotny MJ, Smith W, Henschen AH, Cullor JS. Related Articles, Links

 **Purification, primary structures, and antibacterial activities of beta-defensins, a new family of antimicrobial peptides from bovine neutrophils.**
J Biol Chem. 1993 Mar 25;268(9):6641-8.
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- ☐ 4: Charlet M, Chernysh S, Philippe H, Hetru C, Hoffmann JA, Bulet P. Related Articles, Links

 **Innate immunity. Isolation of several cysteine-rich antimicrobial peptides from the blood of a mollusc, *Mytilus edulis*.**
J Biol Chem. 1996 Sep 6;271(36):21808-13.
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- ☐ 5: Evans EW, Beach GG, Wunderlich J, Harmon BG. Related Articles, Links

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J Leukoc Biol. 1994 Nov;56(5):661-5.
PMID: 7964174 [PubMed - indexed for MEDLINE]


- ☐ 6: Harwig SS, Chen NP, Park AS, Lehrer RI. Related Articles, Links

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PMID: 8452236 [PubMed - indexed for MEDLINE]












- ☐ 7: Selsted ME, Harwig SS. Related Articles, Links

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Infect Immun. 1987 Sep;55(9):2281-6.
PMID: 3623703 [PubMed - indexed for MEDLINE]

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PMID: 1302183 [PubMed - indexed for MEDLINE]

- ☐ 9: Brockus CW, Jackwood MW, Harmon BG. Related Articles, Links

-  Characterization of beta-defensin prepropeptide mRNA from chicken and turkey bone marrow.
Anim Genet. 1998 Aug;29(4):283-9.
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- ☐ **10:** Kagan BL, Ganz T, Lehrer RI. Related Articles, Links
-  Defensins: a family of antimicrobial and cytotoxic peptides.
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PMID: 7512758 [PubMed - indexed for MEDLINE]
- ☐ **11:** Lehrer RI, Ganz T. Related Articles, Links
-  Endogenous vertebrate antibiotics. Defensins, protegrins, and other cysteine-rich antimicrobial peptides.
Ann N Y Acad Sci. 1996 Oct 25;797:228-39. Review.
PMID: 8993365 [PubMed - indexed for MEDLINE]
- ☐ **12:** Gabay JE, Almeida RP. Related Articles, Links
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- ☐ **13:** Mak P, Wojcik K, Thogersen IB, Dubin A. Related Articles, Links
-  Isolation, antimicrobial activities, and primary structures of hamster neutrophil defensins.
Infect Immun. 1996 Nov;64(11):4444-9.
PMID: 8890190 [PubMed - indexed for MEDLINE]
- ☐ **14:** Ganz T, Lehrer RI. Related Articles, Links
-  Defensins.
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PMID: 7946046 [PubMed - indexed for MEDLINE]
- ☐ **15:** Bensch KW, Raida M, Magert HJ, Schulz-Knappe P, Forssmann WG. Related Articles, Links
-  hBD-1: a novel beta-defensin from human plasma.
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PMID: 7628632 [PubMed - indexed for MEDLINE]
- ☐ **16:** Tang YQ, Selsted ME. Related Articles, Links
-  Characterization of the disulfide motif in BNBD-12, an antimicrobial beta-defensin peptide from bovine neutrophils.
J Biol Chem. 1993 Mar 25;268(9):6649-53.
PMID: 8454636 [PubMed - indexed for MEDLINE]
- ☐ **17:** Eisenhauer PB, Harwig SS, Szklarek D, Ganz T, Selsted ME, Lehrer RI. Related Articles, Links
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Infect Immun. 1989 Jul;57(7):2021-7.
PMID: 2543629 [PubMed - indexed for MEDLINE]
- ☐ **18:** Selsted ME, Harwig SS, Ganz T, Schilling JW, Lehrer RI. Related Articles, Links
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J Clin Invest. 1985 Oct;76(4):1436-9.
PMID: 4056036 [PubMed - indexed for MEDLINE]
- ☐ **19:** Schnapp D, Harris A. Related Articles, Links
-  Antibacterial peptides in bronchoalveolar lavage fluid.
Am J Respir Cell Mol Biol. 1998 Sep;19(3):352-6.
PMID: 9730862 [PubMed - indexed for MEDLINE]
- ☐ **20:** Zimmermann GR, Legault P, Selsted ME, Pardi A. Related Articles, Links



Solution structure of bovine neutrophil beta-defensin-12: the peptide fold of the beta-defensins is identical to that of the classical defensins.

Biochemistry. 1995 Oct 17;34(41):13663-71.

PMID: 7577957 [PubMed - indexed for MEDLINE]

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WEST[Generate Collection](#)[Print](#)**Search Results - Record(s) 1 through 4 of 4 returned.**☐ 1. Document ID: WO 206324 A2

L3: Entry 1 of 4

File: EPAB

Jan 24, 2002

PUB-NO: WO000206324A2

DOCUMENT-IDENTIFIER: WO 206324 A2

TITLE: ANTIFUNGAL AND/OR ANTIBACTERIAL PEPTIDES, PREPARATION METHODS AND COMPOSITION CONTAINING SAME

PUBN-DATE: January 24, 2002

INVENTOR-INFORMATION:

NAME

COUNTRY

DIMARCQ, JEAN-LUC

FR

LEGRAIN, MICHELE

FR

MENIN, LAURE

CH

INT-CL (IPC): C07 K 14/435

EUR-CL (EPC): C07K014/435; A01N037/46, A01N063/02

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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☐ 2. Document ID: FR 2811665 A1

L3: Entry 2 of 4

File: EPAB

Jan 18, 2002

PUB-NO: FR002811665A1

DOCUMENT-IDENTIFIER: FR 2811665 A1

TITLE: New peptide derivatives of heliomicine, useful as antibacterial and antifungal agents in human or veterinary medicine and agriculture

PUBN-DATE: January 18, 2002

INVENTOR-INFORMATION:

NAME

COUNTRY

DIMARCQ, JEAN LUC

LEBRAIN, MICHELE

MENIN, LAURE

INT-CL (IPC): C07 K 14/435; A61 K 38/17; A61 P 31/04; A61 P 31/10; A01 N 37/18

EUR-CL (EPC): A01N037/46; A01N063/02, C07K014/435

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC	Draw Desc	Image
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☐ 3. Document ID: WO 9953053 A1

L3: Entry 3 of 4

File: EPAB

Oct 21, 1999

PUB-NO: WO009953053A1
DOCUMENT-IDENTIFIER: WO 9953053 A1
TITLE: GENE CODING FOR HELIOMICINE AND USE THEREOF

PUBN-DATE: October 21, 1999

INVENTOR-INFORMATION:

NAME	COUNTRY
LAMBERTY, MIREILLE	FR
BULET, PHILIPPE	FR
BROOKHART, GARY LEE	US
HOFMANN, JULES	FR

INT-CL (IPC): C12 N 15/12; C07 K 14/435; C12 N 15/82; A61 K 38/17; C12 P 21/02; C12 N 15/62; C12 N 15/81
EUR-CL (EPC): C07K014/435

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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4. Document ID: EP 1299416 A2 WO 200206324 A2 FR 2811665 A1 FR 2811666 A1
AU 200222936 A

L3: Entry 4 of 4

File: DWPI

Apr 9, 2003

DERWENT-ACC-NO: 2002-179779

DERWENT-WEEK: 200325

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TITLE: New peptide derivatives of heliomicine, useful as antibacterial and antifungal agents in human or veterinary medicine and agriculture

INVENTOR: DIMARCQ, J; LEGRAIN, M ; MENIN, L ; DIMARCQ, J L ; LEBRAIN, M

PRIORITY-DATA: 2000FR-0011949 (September 19, 2000), 2000FR-0009248 (July 13, 2000)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
EP 1299416 A2	April 9, 2003	F	000	C07K014/435
WO 200206324 A2	January 24, 2002	F	100	C07K014/435
FR 2811665 A1	January 18, 2002		000	C07K014/435
FR 2811666 A1	January 18, 2002		097	C07K014/435
AU 200222936 A	January 30, 2002		000	C07K014/435

INT-CL (IPC): A01 N 37/18; A61 K 38/17; A61 P 31/00; A61 P 31/04; A61 P 31/10; C07 K 14/435; C12 N 15/12; C12 N 15/82

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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L2	heliomicine?	0	L2
L1	helicomicine?	0	L1

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DATE: Tuesday, May 20, 2003

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L6	brookhart-gary.in.	0	L6
L5	bulet-philippe.in.	13	L5
L4	lamberty-mireille.in.	3	L4
L3	heliomicine	4	L3
L2	heliomicine?	0	L2
L1	helicomine?	0	L1

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L4: Entry 1 of 3

File: EPAB

Jan 3, 2002

PUB-NO: WO000200836A2

DOCUMENT-IDENTIFIER: WO 200836 A2

TITLE: ANTIBACTERIAL AND ANTIFUNGAL PEPTIDES, PREPARATION METHOD AND COMPOSITIONS CONTAINING THEM

PUBN-DATE: January 3, 2002

INVENTOR-INFORMATION:

NAME

BULET, PHILIPPE

HOFFMANN, JULES

LAMBERTY, MIREILLE

COUNTRY

FR

FR

LU

INT-CL (IPC): C12 N 0/

EUR-CL (EPC): C07K014/435; A01N063/02, C12N015/82

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 2. Document ID: WO 200706 A2

L4: Entry 2 of 3

File: EPAB

Jan 3, 2002

PUB-NO: WO000200706A2

DOCUMENT-IDENTIFIER: WO 200706 A2

TITLE: ANTIMICROBIAL PEPTIDES OF THE FAMILY OF DEFENSINS, POLYNUCLEOTIDES ENCODING SAID PEPTIDES, TRANSFORMED VECTORS AND ORGANISMS CONTAINING THEM

PUBN-DATE: January 3, 2002

INVENTOR-INFORMATION:

NAME

LAMBERTY, MIREILLE

BULET, PHILIPPE

LATORSE, MARIE-PASCALE

HOFFMANN, JULES

COUNTRY

FR

FR

FR

FR

INT-CL (IPC): C07 K 14/435

EUR-CL (EPC): C07K014/435; A01N037/46, A01N063/00 , A01N063/02 , C12N015/82

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KWIC	Draw Desc	Image
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☐ 3. Document ID: WO 9953053 A1

L4: Entry 3 of 3

File: EPAB

Oct 21, 1999

PUB-NO: WO009953053A1

DOCUMENT-IDENTIFIER: WO 9953053 A1

TITLE: GENE CODING FOR HELIOMICINE AND USE THEREOF

PUBN-DATE: October 21, 1999

INVENTOR-INFORMATION:

NAME

COUNTRY

LAMBERTY, MIREILLE

FR

BULET, PHILIPPE

FR

BROOKHART, GARY LEE

US

HOFMANN, JULES

FR

INT-CL (IPC): C12 N 15/12; C07 K 14/435; C12 N 15/82; A61 K 38/17; C12 P 21/02; C12 N 15/62; C12 N 15/81

EUR-CL (EPC): C07K014/435

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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(LAMBERTY-MIREILLE.IN.).USPT,PGPB,EPAB,DWPI,TDBD.	3

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File: PGPB

Oct 17, 2002

PGPUB-DOCUMENT-NUMBER: 20020151679

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020151679 A1

TITLE: Alloferons - immunomodulatory peptides

PUBLICATION-DATE: October 17, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Kim, Soo In	Seoul		KR	
Chernysh, Sergey Ivanovich	St. Petersburg		RU	
Bekker, German Petrovich	Essen		DE	
Makhaldiani, Natalia Borisovna	Moscow		RU	
Hoffman, Jules	Strasbourg		FR	
<u>Bulet, Philippe</u>	Vendenhem		FR	

US-CL-CURRENT: 530/327; 435/325, 530/328, 536/23.1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 2. Document ID: US 6331522 B1

L5: Entry 2 of 13

File: USPT

Dec 18, 2001

US-PAT-NO: 6331522

DOCUMENT-IDENTIFIER: US 6331522 B1

**** See image for Certificate of Correction ****

TITLE: Antibacterial and antifungal peptide

DATE-ISSUED: December 18, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Bulet, Philippe</u>	Vendenheim			FR
Hetru, Charles	Illkirch Graffenstaden			FR
Hoffmann, Jules	Strasbourg			FR
Sabatier, Laurence	Molsheim			FR

US-CL-CURRENT: 514/10; 514/12, 514/3, 530/317, 530/324

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 3. Document ID: US 6127336 A

L5: Entry 3 of 13

File: USPT

Oct 3, 2000

US-PAT-NO: 6127336

DOCUMENT-IDENTIFIER: US 6127336 A

**** See image for Certificate of Correction ****

TITLE: Antibacterial and antifungal peptide

DATE-ISSUED: October 3, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bulet; Philippe	Vendenheim			FR
Hetru; Charles	Illkirch Graffenstaden			FR
Hoffmann; Jules	Strasbourg			FR
Sabatier; Laurence	Molsheim			FR

US-CL-CURRENT: 514/10; 514/12, 514/9, 530/317, 530/324

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 4. Document ID: FR 2817260 A1

L5: Entry 4 of 13

File: EPAB

May 31, 2002

PUB-NO: FR002817260A1

DOCUMENT-IDENTIFIER: FR 2817260 A1

TITLE: New Drosophila immune-induced molecule peptides useful for preventing or treating inflammatory and/or immune disorders

PUBN-DATE: May 31, 2002

INVENTOR-INFORMATION:

NAME	COUNTRY
BULET, PHILIPPE	
HOFFMANN, JULES	
SABATIER, LAURENCE	

INT-CL (IPC): C07 K 14/435; C07 K 7/08; A61 K 38/17; A61 K 38/10; A61 P 37/00; A61 P 29/00

EUR-CL (EPC): C07K014/435

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 5. Document ID: WO 200836 A2

L5: Entry 5 of 13

File: EPAB

Jan 3, 2002

PUB-NO: WO000200836A2

DOCUMENT-IDENTIFIER: WO 200836 A2

TITLE: ANTIBACTERIAL AND ANTIFUNGAL PEPTIDES, PREPARATION METHOD AND COMPOSITIONS CONTAINING THEM

PUBN-DATE: January 3, 2002

INVENTOR-INFORMATION:

NAME	COUNTRY
BULET, PHILIPPE	FR
HOFFMANN, JULES	FR
LAMBERTY, MIREILLE	LU

INT-CL (IPC): C12 N 0/

EUR-CL (EPC): C07K014/435; A01N063/02, C12N015/82

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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6. Document ID: WO 200706 A2

L5: Entry 6 of 13

File: EPAB

Jan 3, 2002

PUB-NO: WO000200706A2

DOCUMENT-IDENTIFIER: WO 200706 A2

TITLE: ANTIMICROBIAL PEPTIDES OF THE FAMILY OF DEFENSINS, POLYNUCLEOTIDES ENCODING SAID PEPTIDES, TRANSFORMED VECTORS AND ORGANISMS CONTAINING THEM

PUBN-DATE: January 3, 2002

INVENTOR-INFORMATION:

NAME	COUNTRY
LAMBERTY, MIREILLE	FR
BULET, PHILIPPE	FR
LATORSE, MARIE-PASCALE	FR
HOFFMANN, JULES	FR

INT-CL (IPC): C07 K 14/435

EUR-CL (EPC): C07K014/435; A01N037/46, A01N063/00 , A01N063/02 , C12N015/82

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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7. Document ID: EP 1114829 A2

L5: Entry 7 of 13

File: EPAB

Jul 11, 2001

PUB-NO: EP001114829A2

DOCUMENT-IDENTIFIER: EP 1114829 A2

TITLE: Alloferons - Immunomodulatory peptides

PUBN-DATE: July 11, 2001

INVENTOR-INFORMATION:

NAME	COUNTRY
KIM, SOO IN	KR
CHERNYSH, SERGEY IVANOVICH	RU
BEKKER, GERMAN PETROVICH	DE
MAKHALDIANI, NATALIA BORISOVNA	RU
HOFFMANN, JULES	FR
BULET, PHILIPPE	FR

INT-CL (IPC): C07 K 14/435; C12 N 15/12; C12 N 1/21; C12 N 15/63; A61 K 38/08; A61 K 38/10; A61 K 38/17; A61 P 37/00
EUR-CL (EPC): C07K014/435

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 8. Document ID: WO 9953053 A1

L5: Entry 8 of 13

File: EPAB

Oct 21, 1999

PUB-NO: WO009953053A1
DOCUMENT-IDENTIFIER: WO 9953053 A1
TITLE: GENE CODING FOR HELIOMICINE AND USE THEREOF

PUBN-DATE: October 21, 1999

INVENTOR-INFORMATION:

NAME	COUNTRY
LAMBERTY, MIREILLE	FR
BULET, PHILIPPE	FR
BROOKHART, GARY LEE	US
HOFMANN, JULES	FR

INT-CL (IPC): C12 N 15/12; C07 K 14/435; C12 N 15/82; A61 K 38/17; C12 P 21/02; C12 N 15/62; C12 N 15/81
EUR-CL (EPC): C07K014/435

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KWNC	Draw Desc	Image
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☐ 9. Document ID: WO 9905270 A2

L5: Entry 9 of 13

File: EPAB

Feb 4, 1999

PUB-NO: WO009905270A2
DOCUMENT-IDENTIFIER: WO 9905270 A2
TITLE: CRUSTACEAN ANTIMICROBIAL PEPTIDES

PUBN-DATE: February 4, 1999

INVENTOR-INFORMATION:

NAME	COUNTRY
DESTOUMIEUX, DELPHINE	FR
BACHERE, EVELYNE	FR
BULET, PHILIPPE	FR

INT-CL (IPC): C12 N 15/12; C07 K 14/435; A61 K 38/17
EUR-CL (EPC): C07K014/435

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KWNC	Draw Desc	Image
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☐ 10. Document ID: WO 9730082 A2

L5: Entry 10 of 13

File: EPAB

Aug 21, 1997

PUB-NO: WO009730082A2

DOCUMENT-IDENTIFIER: WO 9730082 A2
TITLE: ANTIFUNGIC AND ANTIBACTERIAL PEPTIDE

PUBN-DATE: August 21, 1997

INVENTOR-INFORMATION:

NAME	COUNTRY
BULET, PHILIPPE	FR
HETRU, CHARLES	FR
HOFFMANN, JULES	FR
SABATIER, LAURENCE	FR

INT-CL (IPC): C07 K 14/435; A01 N 63/02; A61 K 38/17
EUR-CL (EPC): A01N063/02; C07K014/435

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KWIC	Draw Desc	Image
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☐ 11. Document ID: FR 2733237 A1

L5: Entry 11 of 13

File: EPAB

Oct 25, 1996

PUB-NO: FR002733237A1
DOCUMENT-IDENTIFIER: FR 2733237 A1
TITLE: New antibacterial and antifungal peptide(s) from Podisus

PUBN-DATE: October 25, 1996

INVENTOR-INFORMATION:

NAME	COUNTRY
BULET, PHILIPPE	
HOFFMAN, JULES	
FEHLBAUM, PASCALE	
HETRU, CHARLES	
TCHERNYCH, SERGUEY	

INT-CL (IPC): C07 K 14/435; C07 K 7/08; A61 K 38/10; A61 K 38/16; A01 N 37/46
EUR-CL (EPC): A01N037/30; C07K014/435

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KWIC	Draw Desc	Image
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☐ 12. Document ID: FR 2732345 A1

L5: Entry 12 of 13

File: EPAB

Oct 4, 1996

PUB-NO: FR002732345A1
DOCUMENT-IDENTIFIER: FR 2732345 A1
TITLE: Proline-rich antibacterial peptide(s) from Podisus maculiventris

PUBN-DATE: October 4, 1996

INVENTOR-INFORMATION:

NAME

COUNTRY

BULET, PHILIPPE
HOFFMAN, JULES
HETRU, CHARLES
TCHERNYCH, SERGUEY

INT-CL (IPC): C07 K 7/08; C07 K 1/14; A01 N 63/02
EUR-CL (EPC): A01N037/46; A01N063/02, C07K014/435

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KWIC	Draw Desc	Image
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☐ 13. Document ID: WO 9405787 A1

L5: Entry 13 of 13

File: EPAB

Mar 17, 1994

PUB-NO: WO009405787A1

DOCUMENT-IDENTIFIER: WO 9405787 A1

TITLE: GLYCOPEPTIDES, METHOD OF OBTAINING THEM AND BIOLOGICAL APPLICATIONS THEREOF

PUBN-DATE: March 17, 1994

INVENTOR-INFORMATION:

NAME

COUNTRY

BULET, PHILIPPE
HETRU, CHARLES
DIMARCQ, JEAN-LUC
HOFFMANN, JULES
VAN, DORSSELAER ALAIN

FR
FR
FR
FR
FR

INT-CL (IPC): C12N 15/12; C12N 15/63; C12N 15/82; C07K 9/00; A61K 37/02
EUR-CL (EPC): C07K009/00; C07K014/435, C12N015/82

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KWIC	Draw Desc	Image
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Term	Documents
BULET-PHILIPPE.DWPI,EPAB,USPT,PGPB.	13
BULET-PHILIPPES	0
BULET-PHILIPPE.IN..USPT,PGPB,EPAB,DWPI,TDBD.	13
(BULET-PHILIPPE.IN.).USPT,PGPB,EPAB,DWPI,TDBD.	13

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L7: Entry 1 of 5

File: PGPB

Oct 17, 2002

PGPUB-DOCUMENT-NUMBER: 20020151679

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020151679 A1

TITLE: Alloferons - immunomodulatory peptides

PUBLICATION-DATE: October 17, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Kim, Soo In	Seoul		KR	
Chernysh, Sergey Ivanovich	St. Petersburg		RU	
Bekker, German Petrovich	Essen		DE	
Makhaldiani, Natalia Borisovna	Moscow		RU	
<u>Hoffman, Jules</u>	Strasbourg		FR	
Bulet, Philippe	Vendenhem		FR	

US-CL-CURRENT: 530/327; 435/325, 530/328, 536/23.1[Full](#) [Title](#) [Citation](#) [Front](#) [Review](#) [Classification](#) [Date](#) [Reference](#) [Sequences](#) [Attachments](#)[KIMC](#) [Draw Desc](#) [Image](#)☐ 2. Document ID: US 6465719 B1

L7: Entry 2 of 5

File: USPT

Oct 15, 2002

US-PAT-NO: 6465719

DOCUMENT-IDENTIFIER: US 6465719 B1

TITLE: Chimeric gene encoding drosomycin, vector containing it and production of disease-resistant transgenic plants

DATE-ISSUED: October 15, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
DeRose; Richard	Lyons			FR
Freyssinet; Georges	Saint Cry au Mont d'Or			FR
<u>Hoffman; Jules</u>	Strasbourg			FR

US-CL-CURRENT: 800/301; 435/320.1, 435/419, 47/58.1R, 536/23.5, 800/279[Full](#) [Title](#) [Citation](#) [Front](#) [Review](#) [Classification](#) [Date](#) [Reference](#) [Sequences](#) [Attachments](#)[KIMC](#) [Draw Desc](#) [Image](#)

☐ 3. Document ID: WO 9902717 A1

L7: Entry 3 of 5

File: EPAB

Jan 21, 1999

PUB-NO: WO009902717A1

DOCUMENT-IDENTIFIER: WO 9902717 A1

TITLE: CHIMERIC GENE CODING FOR DROSOMICINE, VECTOR CONTAINING IT AND PRODUCTION OF TRANSGENIC PLANTS RESISTANT TO DISEASES

PUBN-DATE: January 21, 1999

INVENTOR-INFORMATION:

NAME

DEROSE, RICHARD

FREYSSINET, GEORGES

HOFFMAN, JULES

COUNTRY

FR

FR

FR

INT-CL (IPC): C12 N 15/82; C12 N 15/62; C07 K 14/435; C12 N 15/12; A01 H 5/00; A01 N 63/00

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KWIC	Draw Desc	Image
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☐ 4. Document ID: FR 2733237 A1

L7: Entry 4 of 5

File: EPAB

Oct 25, 1996

PUB-NO: FR002733237A1

DOCUMENT-IDENTIFIER: FR 2733237 A1

TITLE: New antibacterial and antifungal peptide(s) from Podisus

PUBN-DATE: October 25, 1996

INVENTOR-INFORMATION:

NAME

BULET, PHILIPPE

HOFFMAN, JULES

FEHLBAUM, PASCALE

HETRU, CHARLES

TCHERNYCH, SERGUEY

COUNTRY

INT-CL (IPC): C07 K 14/435; C07 K 7/08; A61 K 38/10; A61 K 38/16; A01 N 37/46
EUR-CL (EPC): A01N037/30; C07K014/435

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KWIC	Draw Desc	Image
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☐ 5. Document ID: FR 2732345 A1

L7: Entry 5 of 5

File: EPAB

Oct 4, 1996

PUB-NO: FR002732345A1

DOCUMENT-IDENTIFIER: FR 2732345 A1

TITLE: Proline-rich antibacterial peptide(s) from Podisus maculiventris

PUBN-DATE: October 4, 1996

INVENTOR - INFORMATION:

NAME

COUNTRY

BULET, PHILIPPE

HOFFMAN, JULES

HETRU, CHARLES

TCHERNYCH, SERGUEY

INT-CL (IPC): C07 K 7/08; C07 K 1/14; A01 N 63/02

EUR-CL (EPC): A01N037/46; A01N063/02, C07K014/435

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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Term	Documents
HOFFMAN-JULES.DWPI,EPAB,USPT,PGPB.	5
HOFFMAN-JULE	0
HOFFMAN-JULES.IN..USPT,PGPB,EPAB,DWPI,TDBD.	5
(HOFFMAN-JULES.IN.).USPT,PGPB,EPAB,DWPI,TDBD.	5

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